CONTACT INFORMATION
Mining Records Curator
Arizona Geological Survey
3550 N. Central Ave, 2nd floor
Phoenix, AZ, 85012
602-771-1601
http://www.azgs.az.gov
inquiries@azgs.az.gov

The following file is part of the G. M. Colvocoresses Mining Collection

ACCESS STATEMENT

These digitized collections are accessible for purposes of education and research. We have indicated what we know about copyright and rights of privacy, publicity, or trademark. Due to the nature of archival collections, we are not always able to identify this information. We are eager to hear from any rights owners, so that we may obtain accurate information. Upon request, we will remove material from public view while we address a rights issue.

CONSTRAINTS STATEMENT

The Arizona Geological Survey does not claim to control all rights for all materials in its collection. These rights include, but are not limited to: copyright, privacy rights, and cultural protection rights. The User hereby assumes all responsibility for obtaining any rights to use the material in excess of "fair use."

The Survey makes no intellectual property claims to the products created by individual authors in the manuscript collections, except when the author deeded those rights to the Survey or when those authors were employed by the State of Arizona and created intellectual products as a function of their official duties. The Survey does maintain property rights to the physical and digital representations of the works.

QUALITY STATEMENT

The Arizona Geological Survey is not responsible for the accuracy of the records, information, or opinions that may be contained in the files. The Survey collects, catalogs, and archives data on mineral properties regardless of its views of the veracity or accuracy of those data.

SILVER REEF MINING COMPANY'S PROPERTY

LOCATION AND TITLE.

The nearest railroad point is Casa Grande, Arizona, 13 miles to the north, on the main line of the Southern Pacific Railroad. The property comprises eleven adjoining and partly overlapping mining claims. Patent has been applied for in the name of Frank M. Leonard, and so far as is known, there are no adverse suits. The Pinal County Records show that Frank M. Leonard purchased the Nugget Claim for $2000.00; the Silver Nugget Claim for $2500.00; the Lead Boulder and Horn Silver Claims, with the mill and other improvements, at Sheriffs sale for $3127.88; and paid various small sums at tax sales.

The property is now vested in the Silver Reef Mining Company, incorporated under the laws of Arizona, with a capitalization of 1,000,000 shares, par value $1.00 each. All the shares have been provisionally alloted as follows:

John Hays Hammond	150,000	shares
H.H.Burger	50,000	"
Chas. H. Leonard	100,000	"
Frank M. Leonard	100,000	"
" " "	500,000	"
Frank W. Royer	100,000	"
	1,000,000	"

The half million block of shares allotted to Frank M. Leonard is intended for sale for development etc. The legal business ofthe incorporation has been attended to by Mr. Chas. H. Leonard, an eminent corporation lawyer, and it may be safely assumed that everything in this connection is in order.

TOPOGRAPHY

The ore deposits occur in rugged hills of moderate elevation above desert plains usual in Arizona. Aneroid readings at the camp varied from 1575 yo 1675 ft. during my visit. (The elevation of Casa Grande, thirteen miles to the north, is given by the railroad as 1395 ft.) The mouth of the main crosscut tunnel on the Nugget Claim showed 1850 ft; the outcrop of the Nugget vein above the crosscut, 1900 ft; and the collar of the main shaft on the Horn Silver vein 1675 ft. Water for milling and domestic purposes is obtained from the mine. There is no local timber. Mining operations can be conducted all the year round, though the summer are rather hot for surface work.

GEOLOGY

The basal formation is coarse granite or pegmatite, containing lenses and veinlets of quartz in all directions, as is common with pegmatite. Overlying the pegmatite are the remains of deposits of andesitic breccia and tufa, which no doubt once covered much larger areas, but have been eroded so that the underlying pegmatite is exposed in the gulches and lower hillsides. The rather basic andesitic breccia immediately above the main crosscut on the Nugget Claim bears much resemblance to the Marshall Basin formation with which you are so well acquainted, but no resemblance to the more acidic rhyolite. I am therefore not adopting Royer's nomenclature.

The veins, of which there are three or four, appear to me to be in shattered fault zones. There is some cross-faulting, but the throw is generally only a foot or two, so that the vein can be easily followed in drifting. The shattered fault zones are silicified so that the quartz filling has a banded structure, both in the andesitic breccia and in the underlying pegmatite. The original constitutent quartz veinlets and lenses of the pegmatite do not have this banded structure, nor apparently any considerable values in silver outside of what I am calling

the shattered fault zones. The pegmatitie does, however, show interesting bunches of sulfenite (molybdate of lead) and venadinite (chloro-vanadate of lead) which I will refer to later when describing the old Horn Silver workings. The portal of the main Nugget crosscut is in pegmatite, but the open workings on the vein a short distance up hill have both walls in the andesitic breccia, though the contact of the andesitic breccia and pegmatit is nearby. A short distance to the west a clean and polished contact shows no ore on the contact. Farther west, towards the middle of the property, both walls of the vein here exposed are in pegmatite, as are both walls of the Horn Silver vein still further west. I must conclude, therefore, that Royer's description of the veins as contact deposits is not justified by the evidence, though where the shattered fault zones happen to coincide with the contact, ore may be found on the contact of the formations. This is no disadvantage to the prospect of finding pay ore in depth in the pegmatite by means of the prospect development work, but rather an advantage. It appears to be a fact, however, that the best silver values have hitherto been found in or near the overlying andesitic breccia, and that the formation is comparatively shallow.

WORKINGS

The notice of application for patent, now posted on the ground, mentions 36 shafts; 8 tunnels, 7 cuts; 8 drifts; 1 winze; 3 crosscuts; and 2 stopes. The total cost is estimated at $22,350,00.

THE NUGGETT WORKINGS

These, the only ones considered in Royer's report, are located at the joint end of the Nugget and Silver Nugget Claims. The vein has a strike of about N 79 E (true) and only a slight dip. A short crosscut tunnel, commencing in pegmatite and soon reaching the andesitic breccia, cuts the vein at a vertical depth of about 50 feet below the outcrop. For a length of about 120 feet stoping has been carried to the surface, and pillars of ore left, presumably less valuable than the ground stoped. About half way to the surface I took a sample across 8 feet of banded quartz and andesitic breccia which assayed (m) 18.10 oz. silver. Near this point Royer's assay map indicates that a sample across 6 feet assayed 15.5 oz. Silver. Here and elsewhere the ore showed no visible silver except possibly a very little argentite, too fine for identification without a microscope. Down below at the fork, in the level, near where Royer indicates a value of 25.8 oz. for 6 feet, my sample across 4 feet assayed (B) 18.30 oz. Next to this I sampled 8 feet which assayed (a) 11.90 oz. My two samples therefore indicate a value of 14 oz. for the total width of 12 feet, which happens to be very close to Royer's figure of 14.2 oz. for 12 feet, based on a large number of samples. My six check samples taken at arbitrary points, averaged 13.5 oz. for 6 feet. Omitting the one sample (H) taken 25 feet above the level, my five samples averaged 12.2 oz. for 5.9 feet. Along the drift at a point where Royer's map indicates 14.6 oz. for 4 feet, my sample across 4 feet assayed (G) 9 oz. My sample across ten feet along both walls of the crosscut immediately north of the drift assayed (L) 11.80 oz. Royer here shows two samples, each 5 ft. assaying 14 oz. and 8 oz. respectively, or 11 oz. for the 10 feet I sampled, a remarkably close check. At a point about 20 feet east of the fork in the drift where Royer indicates 11.6 oz. for a width of 3½ feet, my sample across the same width assayed (M) 11 oz. another remarkably close check. My grab samples from the small dump outside assayed (F) 10.10 oz. From these few check samples I cannot but conclude that the values are aboutnas represented on Royer's assay map, and that they are a reasonable basis for estimating possible ore to be developed by the work now proposed.

With regard to the total width of the pay ore, the cross

cut at the end of the drift was so nearly full of broken dirt, that it could only be fairly sampled after doing more work than would seem warranted at this time. Grabs along 35 feet of broken country rock and quartz which had been thrown back assayed (E) only 2 ounces silver. At the northeast end of the crosscut, extended, I am informed since Royer's sampling, and which might in a few feet be extended through to the surface, is an interesting exposure of the contact of the andesitic breccia where it fills the troughs in the former surface of the pegmatite. At the contact can be seen specularite, iron oxide, a little manganese and slight copper stains. A sample across three feet assayed (K) 2.30 oz. of Silver and a trace of copper. A four inch streak of feldspar, with iron and manganese, assayed (D) 3.50 oz. silver. These are apparently beyond the limits of the pay ore. To arrive at the estimated width of the pay ore expected to be developed below the present crosscut level, Royer has added 3' to the 12' of his average samplings, making 15'. This appears to me to be reasonable. A 40 foot winze, which it is proposed to extend to 100 feet, shows ore near the bottom. Water now in the winze prevented my sampling the ore without the erection of a stage etc. which did not appear to be warranted at this time. The 25000 tons of possible ore estimated by Royer as below the crosscut level have, of course, yet to be developed by the extension of the winze another 60 feet, and the driving of 250 feet of level and a 100 foot raise from the bottom. Some development work will also have to be done above the crosscut tunnel level to make the ore there available. The estimated cost of $25,000 should be plenty for the proposed development work on the Nugget vein.

THE HORN SILVER WORKINGS.

The shaft, called 325' deep, on the considerably flatter slope of the vein than the Nugget vein, is shown by the aneroid to have a vertical depth of 235 feet. A 50 foot winze, now full of water, has been sunk from the bottom level. Considerable stoping has been done, but I am informed that the silver ore now in sight is mostly of too low grade to be commercial. Both vein walls are pegmatite and I judge the average width of the vein to have been about four feet. In places the vein matter is brecciated. The silver values were probably bunchy. On the bottom level near the mouth of the winze, are small bunches of wulfenite and vanadinite One sample (H) across one foot assayed 4.40 oz. silver; .42% molybdic acid; and .16% vanadic acid. Another sample nearby, same width, assayed (I) 4.50 oz. silver; .66% Molybdic acid; .65 vanadic acid. On the second level above is a considerable showing of disseminated wulfenite and vanadinite. On the chance of finding a definite pay streak of molybdenum or vanadium ore, some prospecting would seem to be advisable here. Fifteen to twenty per cent molybdic acid concentrates are now worth two dollars or more per pound at Arizona points, for the contained molybdenum, which is six-tenths of the molybdic acid. The wulfenite is not difficult to concentrate. The Vanadium is generally considered objectionable with the molybdenum, but can easily be separated chemically and then has a good market value. Some grab samples I took from the Horn Silver dump, more particularly for the molybdenum and vanadium, assayed (J) 18.0 oz.silver; .10% Molybdic acid; and .50% Vanadic acid. The small tailing pile at the mill grab sampled by scraping some of the surface assayed (G) silver 9.20 oz; Molybdic acid .64%.

METALLURGY

Reports on Cyanide tests made on the ore by Sill and Sill, Los Angeles, for the owners, indicate an extraction of 80 to 89.3% of the silver values. (The gold content is generally negligible.) The consumption of cyanide varied from 1 lb. to 4.2 lbs. per ton of ore treated. and of lime, from 2.4 to 5.2 lbs. A combined flotation and cyanide process has also been experimented with. In any event, Royer's estimate of $3.00 per ton for milling should cover the cost.

EQUIPMENT

The mill contains a Dodge crusher; 20 Fraser and Chalmers gravity stamps; old vanners (dismantled); tube mill; cone classifier; and a Fairbanks and Morse 40 H.P. engine. The building itself is in bad repair. Outside are two old type copper smelters, one never erected; and 2 Baker blowers. Two old boilers are probably beyond repair. There is a fairly complete set of tools for a small crew on the ground. The camp buildings,other than the mill, are in fair condition.

CONCLUSIONS.

The property appears to be worthy of further development, with a good chance of success. As suggested in my telegraphic message, I think you are entitled to more favorable terms, inasmuch as without the expenditure of such funds as you are asked to supply, the present promoters can reap little, if any, profit from their investment.

Respectfully submitted,

(signed) L.F.S.Holland

Mining Engineer.

COPY

701 Hollingsworth Bldg.,
Los Angeles, California.

August 14th, 1917.

Mr. John Hays Hammond,
120 Broadway,
New York City.

Dear Sir:-

I beg to submit for your consideration and approval a plan to finance the treasury of the proposed Silver Reef Mining Company.

This company is in process of formation. The holdings consist of eleven mining claims upon which survey for U. S. patents have been made and it is expected that the patents will be granted some time this fall.

The company being formed will have a capital of 1,000,000 shares par value $1.00 per share.

It is proposed to issue 500,000 of the shares of this corporation to the present owners of this property, as follows:

John Hays Hammond - 40%	200,000	shares
Chas. M. Leonard - 20%	100,000	"
Frank M. Leonard - 20%	100,000	"
Frank W. Royer - 20%	100,000	"
Total shares issued	500,000	"

This will leave 500,000 shares unissued, which can be issued and sold as funds are required for developing and equipping this property.

ASSETS:

The assets of this company will consist of 11 patented mining claims upon which are located a number of living houses, boarding house, stables, a twenty-stamp mill containing a 15" x 24" Blake crusher, 5" x 12" tube mill, a number of steel tanks, a 40 H.P. gas engine, etc.

The mill building and much of this machinery is in a fair state of repair and will be used when a new milling plant is built.

Located near the upper end of this mill a shaft 250 feet in depth has developed enough water to supply a camp and mill of at least 100 tons daily capacity.

This shaft is equipped with a Cornish type pump, operated by a gas engine, all of which is in good working order.

VEINS AND ORE BODIES:

The country rock is granite and rhyolite. The veins are lead, copper, silver bearing veins at the contract of the granite with the rhyolite, and in some instances entirely in the granite.

The gangue rock of the veins is quartz and brecciated country rock.

Four large veins are within the boundaries of these claims. At one time the veins included within the limits of these claims were owned by a number of different companies or individuals, and considerable work was done and ore shipped from every vein.

The workings having the best showing of ore at present are located in the Nugget claims. A map of these workings accompanies this report.

ORE BODIES IN THE NUGGET WORKINGS:

The workings shown on the accompanying map consist of a short cross-cut tunnel which cuts the vein at a depth of 60 feet below the outcrop; a drift along the vein for a distance of 150 feet, and a winze 40 feet deep below this adit level.

These workings have been thoroughly sampled by me.

The adit level for a length of 120 feet and for a width of ore exposed of 15 feet gives an average of 14.2 ozs. silver per ton. This average does not include high grade ore which has been gouged out and shipped.

Above the adit level there is exposed in the accessible portion of the vein, ore which, over an average width of 4.7 feet assays 36.7 ounces silver.

The vein on the surface and the adit level is from 24 to 35 feet wide.

ORE BODIES:

Before a tonnage of ore can be estimated some development work must be done.

It is estimated that there remains in the old workings above the adit level to the surface and to a distance of fifty feet

beyond the present breasts, 7000 tons of ore having an average value of 25.0 ounces of silver per ton. This is obtained by assuming the vein to be but 15 feet in width while the outcrop and two crosscuts on the adit level show the width of ore to be 33 feet.

Below the adit level, to a depth of 100 feet and assuming the ore to continue to a distance of 50 feet beyond the extremity of the ore opened on the adit level, or a total length of ore shute 250 feet, and assuming the width of workable ore to be but 15 feet, there will be in this block 26,000 tons, value 14.2 oz. silver.

On the dump at the mouth of this adit is 200 tons of ore assaying 15.9 oz. silver.

SUMMARY

	TONS	Ounces Silver	Total Ounces
Above adit level	7,000	25	175,000
To depth 100 feet below	26,000	14.2	369,200
In dump	200	15.9	3,180
	33,200		547,380 oz.

Average per ton 16.5 oz. silver.

The cost of doing the work necessary to open up this ground sufficient to put the above tonnage figures in sight will be:

Drifts and raises on and above adit level.....	290 ft.
Winze to depth of 100 feet	60 "
Drifts on 100 foot level	250 "
Raise	100 "
TOTAL	600 "

Practically no timbers or equipment would have to be purchased for this work.

The total cost of doing this work including general expenses, etc. will not exceed $25,000.

Tests have been made upon samples of this ore by several metallurgical firms and they report that by combined flotation and cyanide, a recovery of 90 to 93% of the silver value, with a loss of cyanide of from 1 to 3 lbs. per ton of ore treated.

Assuming a recovery of 80% of the silver and giving no consideration to the lead or small amount of gold in the ore which would be saved by flotation and cyanide, we have:

Total tonnage - - 33,200.

Basis 100 tons daily-Average value per ton 16.5 oz Silver
Silver at 85 cts.

80% of 16.5 oz. - 13.20 oz. at 85 cts. $11.22

Costs

Mining	$2.00	
To Mill	.25	
Milling	3.00	
Metal realization	.25	5.50

Estimated profit per ton .....$ 5.72

To put the present mill in shape to mill economically 75 to 100 tons per day using a combined flotation and cyanide treatment should not exceed a total of $40,000.

SUMMARY AND CONCLUSION

The development of the Nugget mine should be started at once. The bottom of the winze and both breasts of the adit level, where work will be started, are in low grade ore, and judging from the meager data obtained from sampling the outcrop, ore may be expected to extend for much longer distances than I have estimated. The money necessary to do the work required is $25,000, which should be raised immediately. Considerable high grade silver ore has been encountered and shipped while running the adit level and it is probable that in doing the work contemplated some revenue can be obtained from shipments.

The chances for opening up a big low grade silver mine are extremely good and the figures given above are simply meant to illustrate what I consider to be the poorest possible outcome of this development work provided the values to not leave entirely as we go down.

Sincerely,

(signed) F. W. Royer

c-o-p-y

HARRIS HAMMOND
120 Broadway
New York

February 1st, 1918.

Frederic N. Watriss, Esq.,
32 Nassau Street,
New York City.

Dear Fred:-

I am sending you a copy of a report made by Royer to Mr. Hammond on the Silver Nugget Property, now known as the Silver Nugget Company.

It is our desire to raise $25,000.00 as mentioned in this report, which money will be put back into the property, to do the necessary work to prove up the extent and continuation of value on that portion of the property upon which we have already done work as shown on the accompanying map.

There are 500,000 shares of stock free for the purpose of financing. We are going to make a uniform price of 25 cts. a share, so that an investment of all of this stock would amount to $125,000. The $25,000 originally put up, should the property prove disappointing, can be salvaged by such ore as is already in sight. The remaining $100,000 would be put into the property, to insure us 100 to 150 tons output a day, in the shape of mills, Machinery, cyanide plant etc.

I personally believe that this is a very good gamble and the possibilities of a big property make it well worth while, as the risk is offset by the possibility of salvage. The option for putting up the $25,000 for which you would receive 100,000 shares of stock, would be given on the remaining 400,000 shares, at 25 cts. a share, and would extend 90 days after notification from us that the development work has been done, and the mine was open to examination by your appointee.

Of this last 400,000 shares, I should like very much to have a personal option on 100,000 shares on the same terms, or any part of 100,000 shares that you may think proper. I was not in this proposition at its inception and have no interest to date, but if you feel that you would prefer to have the whole thing, it will be agreeable to me, and I will understand, as what I am asking is purely in the nature of a favor and based upon no particular grounds except that I should like to be interested, and look after Royer for an additional amount of stock.

Royer leaves tomorrow afternoon for the West. If you could arrange with Buckley Wells and have word in time from him, we could let Royer know where to expect to meet him.

With best regards, I am

Sincerely yours,

(sgd) HARRIS HAMMOND.

NOTES ON SILVER NUGGET and SILVER REEF MINE

Location: 12 miles south of Casa Grande, Arizona; by very good road; approximately 19 miles south of the Lake Shore Mine.

Date Visited: April 28th, 1920 - with F. W. Leonard and F. B. Church.

The property consists of 10 claims and one fraction; owned by the Silver Reef Mining & Milling Co.; see blue print of claims and assay maps attached.

Outcrop and workings lie on the slope of steep hill facing to the north and on tilted contact between granite foot wall and rhyolite hanging wall. I am not certain whether there is a true contact fissure at this point or not; strike of veins East and West.

Silver Ledge workings about 425 feet deep and considerable drifting; also some stoping. Equipped with an old Mill and Lead Jacket for smelting ore. Treatment was concentration and cyanidation of tailings. An attempt was made to smelt the concentrates but appears to have been unsuccessful. The first work done here was in the 70's and 80's; mill and smelter constructed in the 90's. Was apparently largely a stock selling project. Ore carries lead and low values in silver. Workings were not visited and were stated by Leonard to show very little ore.

The Silver Nugget Mine lies 3500 feet east of the Silver Ledge. It is developed by an adit with old stopes and raises to the surface, about 60 feet above a winze about 60 feet deep. Equipment consists of a gasoline engine; small compressor and some rails and mine cars.

Vein is developed for length of about 120 feet in an adit level and apparently no working was done at the bottom of the winze, altho it is said that good ore was found continuously in the winze. Assay maps show ore to continue both ends of drift and apparently ore body is somewhat wider than development would indicate. The width appears to be about 50 feet and the average grade of ore according to Royer's sampling which was checked by Johns is 14 oz. silver. There is no gold and very little lead in this ore. The values are mainly in the form of silver-chloride, also some argentite. The ground is quartz; crushed wall rock and considerable lime. The

high-grade ore has been stoped out in stringers and small lenses.

Royer estimated as positive 30,000 tons of 14 oz. ore above the adit. This estimate appears reasonable from measurements and assay map. The principal value of the property lies in the probability of developing a much larger tonnage below the adit and at the other end of the drift. If the vein is actually 50 feet wide it will run into tonnage fast, and the prospect seems well worth additional development which could be accomplished at comparatively small expense.

I would estimate working costs roughly as follows:

MINING	$2.00	
Treatment	4.00	
Overhead and selling expense	1.00	
Total		$7.00 per ton.

Assume recovery of 80% of the values and average grade of ore 14 oz. per ton with silver at $1.00 per ounce and a recovery of $11.20 per ton should be effected, leaving a net profit of $4.20 per ton of ore mined or $420,000.00 on the 100,000 tons which should be developed before the Syndicate was obliged to purchase the principal quantity of stock. In this way the Syndicate would be assured of getting their money back even if no more ore were developed and would have a most excellent chance to make a large profit in the probable event of additional ore reserves being proven and subsequently mined and treated.

It would appear from the above that the mine might be worked profitably with silver down to 70 cents per ounce and the cost figures are believed to be liberal estimates which might be materially improved with practice.

(Signed) Leonard & Church

Humboldt, Arizona
May 5th, 1920.

MUFFLE TEST ON SILVER NUGGETT ORE

Humboldt, Arizona May 17th, 1920.

Head Assay

Au = tr
Ag = 22.0 Oz.

Charge

Test	Wt Ore	Wt Salt	Time	Temp	Wt Calcines	Assay Cal Ag	Extraction Ag
159	50.	2 NaCl 1.5 CaCl2	35 25	940-1040	45.9	3.10	87.1

SILVER REEF (SILVER NUGGET)

9;18;36

Frank Leonard, Sr. called and said that he and the others who operated this property had taken out all the pay ore and left only a lotof ground which would only carry 4 to 6 oz. silver per ton. When Young Frank and Don Reed were working they had a 75¢ freight rate to Hayden and a flat treatment charge of $1.00 per ton and worked just as long as it would pay

Later when Percy Williams took it over he did spend a lot of money and did much new development but entirely failed to find any new shoots of pay ore and Butler and other engineers who examined the mine assured him that it was a perfectly hopeless venture and his financial backer dropped it sometime before he died. Neither Leonard nor Mr. Forback thought that the claims were worth holding and so they let Clausen restake them without opposition.

Clausen knowns nothing of mining but his statement that a substantial quantity of pay ore can be measured and sampled in the Williams workings is entirely untrue according to Leonard.

SILVER REEF MINE

Blue Bell Mine,
Mayer, Arizona
December 4, 1920

Mr. G. M. Colvocoresses, General Manager,
Consolidatad Arizona Smelting Company,
Humboldt, Arizona.

Dear Sir:-

Pursuant to your request, I have carefully examined the Silver Reef Mine, also, I have gone over the Horn Silver workings, as carefully as possible under the conditions. On the Horn Silver property, only those samples were taken, that, in my judgment, seemed necessary. I spent seven days, from October 21st to October 28th, on the ground and herewith submit my report:

The Silver Reef property is worthy of further development. On it, there is probable ore exposed, of such value, that with a mill on the ground, it may be worked profitably; also the quantity is such that it would pay, for the necessary development and putting the mill in order.

The Silver Reef workings lie at the junction of the Silver Nugget and the Nugget claims -- the two having coincident end lines. The vein is well defined and may be traced the full length of the Silver Nugget claim to the East and also about two hundred feet Westward into the Nugget claim. It is a quartz vein associated with the contact of rhyolite and earlier granite and made up of small quartz stringers. In some places the vein lies wholly in the granite and in others in the rhyolite; but the best ore seems to be found where it is at the contact, or, in the rhyolite. There are small amounts of wulfenite and vanadinite throughout the workings; also some galena, argentite and native silver. However, the valuable minerals in the upper workings are the hornsilvers. These minerals indicate a lead silver vein in the depth and this is born out by the appearance of galena in the bottom of the winze. At points along the outcrop, the vein is as wide as thirty feet. In the bottom of the winze which is one hundred and twenty five feet below the adit level, or, about two hundred feet below the surface, the vein is fully fifteen feet wide. I believe the longitudinal extension of the ore will be at

least fifty feet beyond the present faces. I do not believe ore will be found at any greater depth than the bottom of the winze.

My sampling of the outcrop did not indicate the presence of other ore shoots. There is another vein about seven feet wide seen in the adit at the west end of the Nugget claim. It's strike is about perpendicular to that of the Silver Reef vein. It is highly mineralized. Where I sampled it, it contained 2.20 ounces of silver and some copper. This vein, the Horn Silver and Silver Reef veins constitute the only three veins of any importance on the property.

The property is situated in Pinal County, Arizona, twelve miles from the Southern Pacific railroad, at Casa Grande, and is in the low rugged hills at the edge of the desert. The climate, although very hot in the summer, is such that work may be conducted all the year round. The road across the desert from the Mine is almost level and always passable.

From the assay map, it will be seen that for one hundred and twenty-eight feet along the adit level, the ore averaged 17.36 ounces of silver per ton, over an average width of 7.4 feet. For one hundred and twenty-three feet down the winze, the ore averaged 8.38 ounces of silver per ton over an average width of 5.8 feet. In the raise above the adit level for seventy-two feet, the ore averaged 17.88 ounces of silver per ton over an average width of 3.55 feet. From these figures, there are 1,540 tons of probable ore above the adit level, averaging 15.06 ounces of silver per ton. There are also 7,760 tons of probable ore below the adit level averaging 13.50 ounces of silver per ton.

9 Assuming a fifteen foot vein and extension of the ore body to fifty feet beyond the present faces, there are 7000 tons above the adit level and 34000 tons below the adit level. The development work necessary to prove or disprove the probable ore and also to develop the ore to the extent of 34000 tons below the adit level and 7000 tons above, could be done by four hundred feet of drifting and

one hundred and twenty-five feet of raising. This development work could be done for fifteen thousand dollars. No timbering would be necessary.

There is no appreciable amount of ore above the adit level that will average twenty-five or more ounces of silver to the ton.

The equipment of the old cyanide mill on the Horn Silver property is as follows:

1 - 12" x 14" jaw crusher
1 - Stampmill consisting of 4 batteries and 5 stamps each
1 - 5' x 12' tube mill
1 - 40 H.P. Fairbanks-Morse gas engine
3 - 5' x 16' steel leaching tanks
2 - 8' x 12' steel tanks
5 - 8' x 8' steel tanks
16 - zinc boxes

All this equipment is in a good state of repair and could be made use of in reconstructing the mill. There are several other pieces of equipment such as vanners, boilers and an old type blast furnace. These are all practically worthless. The mill could be made modern and put in order to handle one hundred tons for forty thousand dollars. There is also a Cornish pump and a six horse power gasoline engine on the Horn Silver used to pump water from the Mine. These are in good condition. At the Silver Reef, there is a six horsepower gasoline hoist and forge in good condition.

There is plenty of water in the Horn Silver shaft to run a mill of one hundred ton capacity. A cyanide mill or combined cyanide and flotation mill will be best suited to treat the ore. The cost of mining and milling should not exceed seven dollars per ton. Transporation to Casa Grande costs thirty-five cents per ton mile or four dollars and twenty cents per ton. This price could probably be reduced to three dollars on a contract for a large amount of haulage.

The accessible workings of the Horn Silver showed no material that could be handled profitably. The water level was three hundred and twenty-seven feet below the collar of the shaft measured along the dip. This made some of the lower workings inaccessible. All the available ore has been taken and was mined from the

narrow stope shown on the map to the left of the shaft. There is much more wulfenite and vanadinite shown in these workings than in the Silver Reef.

Very truly yours,

(Signed) Wayne A. Harrod.

SILVER REEF & SILVER NUGGET.

Note by G. M. Colvocoresses, October, 1937.

The result of Harrod's examination and sampling made this property appear unattractive except for very small scale operations.

Subsequently it was worked by lessees who shipped a considerable tonnage of ore but barely covered their expenses.

In about 1933 some additional development was done and a certain amount of ore was opened up in the lower workings, but according to the most reliable information that I have been able to obtain it is too low grade to be worked with any profit.

There is a good site for a Mill or Treatment Plant on the hillside below the mouth of the adit and the ore should be susceptible to treatment by cyanidation or Volatilization.

NOTE: see Volatilization test on sample taken from Dump.

There is said to be plenty of water at the bottom of the Silver Ledge shaft and the quality if reported good. The property has been all surveyed and passed for Patent and Patent will be issued on payment of the necessary fee, according to Leonard.

The Company owning this property is known as the Silver Ledge Mining & Milling Co., an Arizona corporation; capital 1,000,000 shares of Common Stock at $1.00 par value per share. The stock is now held as follows: -

F. W. Leonard	100,000	shares
Chas. Leonard	100,000	"
F. W. Royer	100,000	"
John Hays Hammond	150,000	"
James Gerard	100,000	"
Total issued	550,000	"
Stock in Treasury	450,000	"
	1,000,000	"

There is apparently no cash in the Treasury and no market for the Treasury Stock. The owners of the issued stock put up part cash and altogether some $50,000.- appears to have been spent by the present Company, this including the cost of purchasing the claims and a very small amount of development work.

My suggestion to Leonard was that all owners of stock should put back into the Treasury one-half of their holdings which would then provide the Treasury with a total of 725,000 shares leaving 275,000 shares with the present stock-holders pro-rata. A Syndicate then to be formed by parties to whom 25,000 shares of stock should be given for promotion and on the basis of a new sampling to be conducted at the expense of these parties. The Syndicate should guarantee, - provided such sampling checked Royer's results, - to purchase at once 100,000 shares of Treasury stock at 25 cents per share, thus providing the Company with $25,000.- necessary for additional development. If the expenditure of this money resulted in developing an additional 70,000 tons of ore, or thereabouts, the Syndicate should further guarantee to purchase the remaining 600,000 shares at 25 cents a share thus providing the Company with an additional $150,000.00 of which sum approximately $25,000.- would be required for additional Mine equipment and approximately $100,000.00 for the construction of a treatment plant, leaving $25,000.- working capital which, under the conditions, should be sufficient. The present stock-holders should have the right to participate in the Syndicate in such share as to leave to them 49 % of the total authorized stock of the Company; leaving to the new investors and promotors 51 %, i.e., the controlling interest.

SILVER REEF MINING COMPANY'S PROPERTY.

LOCATION AND TITLE.

The nearest railroad point is Casa Grande, Arizona, 13 miles to the north, on the main line of the Southern Pacific Railroad. The property comprises eleven adjoining and partly overlapping mining claims. Patent has been applied for in the name of Frank M. Leonard, and so far as is known, there are no adverse suits. The Pinal County Records show that Frank M. Leonard purchased the Nugget Claim for $2000 the Silver Nugget Claim for $2500; the Lead Boulder and Horn Silver Claims, with the mill and other improvements, at Sheriffs Sale for $3127.88; and the various small sums at tax sales.

The property is now vested in the Silver Reef Mining Co., incorporated under the laws of Arizona, with a capitalization of 1 million shares, par value $1.00 each. All the shares have been provisionally allotted as follows:

John Hays Hammond	150,000 shares
H. H. Burger	50,000 "
Chas. H. Leonard	100,000 "
Frank M. Leonard	100,000 "
" " "	500,000 "
Frank W. Royer	100,000 "
	1,000,000 "

The half million block of shares allotted to Frank M. Leonard is intended for sale for development, etc. The legal business of the incorporation has been attended to by Mr. Chas. H. Leonard, an eminent corporation lawyer, and it may be safely assumed that everything in this connection is in order.

TOPOGRAPHY: The ore depositsoccur in rugged hills of moderate elevation above desert plains usual in Arizona. Aneroid readings at the camp varied from 1575 to 1675 ft. during my visit. (The elevation of Casa Grande, thirteen miles to the north, is given by the railroad as 1395 ft.) The mouth of the main crosscut tunnel on the Nugget Claim showed 1850 ft. and the collar of the Nugget vein above the crosscut, 1900'; and the collar of the main shaft on the Horn Silver vein 1675'. Water for milling and domestic purposes is obtained from the mine. There is no local timber. Mining operations can be conducted all the year round, tho the summers are rather hot for surface work.

GEOLOGY: The basal formation is coarse granite or pegmatite, containing lenses and veinlets of quartz in all directions, as is common with pegmatite. Overlying the pegmatite are the remains of deposits of andesitic breccia and tufa, which no doubt once covered much larger areas, but have been eroded so that the underlying pegmatite is exposed in the gulches and lower hillsides. The rather basic andesitic breccia immediately above the main crosscut onthe Nugget Claim bears much resemblance to the Marshall Basin formation with which you are so well acquainted, but no resemblance to the more acidic rhyolite. I am therefore not adopting Royer's nomenclature.

The veins, of which there are three or four, appear to me to be in shattered fault zones. There is some cross-faulting but the throw is generally only a foot or two, so that the vein can be easily followed in drifting. The shattered fault zones are silicified so that the quartz filling has a banded structure, both in the andesitic breccia and in the underlying pegmatite. The original constitutent quartz veinlets and lenses of the pegmatite do not have this banded structure, nor apparently any considerable values in silver outside of what I am calling the shattered fault zones. The pegmatite does, however, show interesting bunches of sulfenite (molybdate of lead) and venadinite (chloro-vanadate of lead) which I will refer to later when describing the old Horn Silver workings. The portal of the main Nugget crosscut is in pegmatite, but the open workings on the vein a short distance up hill have both walls in the andesitic bfeccia, though the contact of the andesitic breccia and pegmatite is nearby. Ashort distance to the west a clean and polished contact shows no ore on the contact. Further west, towards the middle of the property, both walls of the vein here exposed are in pegmatite, as are both walls of the Horn Silver vein further west. I must conclude, therefore, that Royer's description of the veins as contact deposits is not justified by the evidence, though where the shattered fault zones happen to coincide with the contact, ore may be found on the contact of the formations. This is no disadvantage to the prospect of finding pay ore in depth in the pegmatite by means of the prospect development work, but rather an advantage.

It appears to be a fact, however, that the best silver values have hitherto been found in or near the overlying andesitic breccia, and that the formation is comparatively shallow.

WORKINGS: The notice of application for patent, now posted on the ground, mentions 36 shafts; 8 tunnels, 7 cuts, 8 drifts; 1 winze, 3 crosscuts; and 2 stopes. The total cost is estimated at $22,350,00.

THE NUGGET WORKINGS: These, the only ones considered in Royer's report are located at the joint end of the Nugget and Silver Nugget Claims. The vein has a strike of about N. 79 E. (true) and only a slight dip. A short crosscut tunnel, commencing in pegmatite and soon reaching the andesitic breccia, cuts the vein at a vertical depth of about 50' below the outcrop. For a length of about 120' stoping has been carried to the surface, and pillars of ore left, presumably less valuable than the ground stoped. About half way to the surface I took a sample across 8' of banded quartz and andesitic breccia which assayed (n) 18.10 oz. silver Near the point Royer's assay map indicates that a sample across 6' assayed 15.5 oz. Silver. Here and elsewhere the ore showed no visible silver except possibly a very little argentite, too fine for identification without a microscope. Down below/at the fork, in the level, near where Royer indicates a value of 25.8 oz. for 6 feet, my sample across 4' assayed (l) 18.30 oz. Next to this I sampled 8' which assayed (a) 11.90 oz. My two samples therefore indicate a value of 14 oz. for the total width of 12 feet, which happens to be very close to Royer's figure of 14.2 oz. for 12', based on a large number of samples. My six check samples taken at arbitrary points, averaged 13.5 oz. for 6 ft. Omitting the one sample (n) taken 25' above the level, my five samples averaged 12.2 oz. for 5.9 feet. Along the drift at a point where Royer's map indicates 14.6 oz. for 4 ft. my sample across 4 ft. assayed (c) 9 oz. My sample across 10' along both walls of the crosscut immediately north of the drift assayed (l) 11.80 oz. Royer here shows two samples, each 5', assaying 14 oz. and 8 oz. respectively, or 11 oz. for the 10' I sampled, a remarkably close check. At a point about 20' east of the fork in the drift where Royer indicates 11.6 oz. for a width of 3½ft. my sample across the same width assayed (M) 11 oz. another remarkably

close check. My grab samples from the small dump outside assayed (F) 10.10 oz. From these few check samples I cannot but conclude that the values are about as represented on Royer's assay map, and that they are a reasonable basis for estimating possible ore to be developed by the work now proposed.

With regard to the total width of the payore, the crosscut at the end of the drift was so nearly full of broken dirt, that it could only be fairly sampled after doing more work than would seem warranted at this time. Grabs along 35' of broken country rock/and quartz which had been thrown back assayed (E) only 2 oz. silver. At the northeast end of the crosscut, extended, I am informed since Royer's sampling, and which might in a few feet be extended thru to the surface, is an interesting exposure of the contact of the andesitic breccia where it fills the troughs in the former surface of the pegmatite. At the contact can be seen specularite, iron oxide, a little manganese and slight copper stains. A sample across three feet assayed (K) 2.30 oz. of Silver and a trace of copper. A four inch streak of feldspar with iron and manganese, assayed (D) 3.50 oz. silver. These are apparently beyond the limits of the pay ore. To arrive at the estimated width of the pay ore expected to be developed below the present crosscut level, Royer has added 3' to the 12' of his average samplings, making 15'. This appears to me to be reasonable. A 40' winze, which it is proposed to extend to 100 ft. shows ore near the bottom. Water now in the winze prevented my sampling the ore without the erection of a stage, etc. which did not appear to be warranted at this time. The 25,000 tons of possible ore estimated by Royer as below the crosscut level have, of course, yet to be developed by the extension of the winze another 60', and the drifing of 250' of level and a 100' raise from the bottom. Some development work will also have to be done above the crosscut tunnel level to make the ore there available. The estimated cost of $25,000 should be plenty for the proposed development work on the Nugget Vein.

THE HORN SILVER WORKINGS. The shaft, called 325' deep on the considerably flatter slope of the vein than the Nugget vein, is shown by the aneroid to have a vertical depth of 235'. A 50' winze, now full of water, has been sunk from the bottom level. Considerable stoping has been done, but I am informed that the silver ore now in sight is mostly of too low grade to be commercial. Both vein walls are pegmatite and I judge the average width of the vein to have been about 4'. In places the vein matter is brecciated. The silver values were probably bunchy. On the bottom level near the mouth of the winze, are small bunches of wulfenite and vanadinites. One sample (H) across one foot assayed 4.40 oz. silver; .42% molybdic acid; and .16% vanadic acid. Another samplenearby, same width, assayed (I) 4.50 ozl silver; .66% Molybdic acid; .65 vanadic acid On the second level above is a considerable showing of disseminated wulfenite and vanadinite. On the chance of finding a definite pay streak of molybdenum or vanadium ore, some prospecting would seem advisable here. Fifteen to twenty per cent molybdic acid concentrates are now worth two dollars or more per pound at Arizona points, for the contained molybdenum, which is 6/10 of the molybdic acid. The wulfenite is not difficult to concentrate. The vanadium is generally considered objectionable with the molybdenum, but can easily be separated chemically and then has a good market value. Some grab samples I took from the Horn Silver dump more particularly for the molybdenum and vanadium, assayed (J) 18.0 oz. silver; .10% Molybdic acid. and .50% vanadic acid. The small tailing pile at the mill grab sampled by scraping some of the surface assayed (g) Silver 9.20 oz/ Molybdic acid .64%.

METALLURGY: Reports on cyanide tests made on the ore by Sill and Sill, Los Angeles, for the owners, indicate an extraction of 80 to 89.3% of the silver values. (The gold content is generally negligible.) The consumption of cyanide varied from 1 pound to 4.2 lbs. per ton of ore treated, and of lime, from 2.4 to 5.2 pounds. A combined flotation and cyanide process has also been experimented with. In any event, Royer's estimate of $3.00 per ton for milling should cover the cost.

EQUIPMENT: The mill contains a Dodge crusher; 20 Fraser and Chalmers gravity stamps; old vanners (dismantled) tube mill; cone classifier

and a Fairbanks and Morse 40 H. P. engine. The building itself is in bad repair. Outside are two old type copper smelters, one never erected, and 2 Baker blowers. Two old boilers are probably beyond repair. There is a fairly complete set of tools for a small crew on the ground. The camp buildings, other than the mill are in fair condition.

CONCLUSIONS: The property appears to be worthy of further development with a good chance of success. As suggested in my telegraphic message, I think you are entitled to more favorable terms, inasmuch as without the expenditure of such funds as you are asked to supply, the present promoters can reap little, if any real profit from their investment.

Respectfully submitted,

(signed) L. F. S. Holland

Mining Engineer.

Copy

Silver Reef or ~~Horn Silver~~ Silver Nugget Pinal County near Casa Grande

copied m.f.

Blue Bell Mine,
Mayer, Arizona.
December 4, 1920.

Mr. G.M.Colvocoresses, General Manager,
Consolidated Arizona Smelting Company,
Humboldt, Arizona.

Dear Sir:-

Pursuant to your request, I have carefully examined the Silver Reef Mine, also, I have gone over the Horn Silver workings, as carefully as possible under the conditions. On the Horn Silver property, only those samples were taken, that, in my judgment, seemed necessary. I spent seven days, from October 21st to October 28th, on the ground and herewith submit my report:

The Silver Reef property is worthy of further development. On it, there is probable ore exposed, of such value, that with a mill on the ground, it may be worked profitably; also the quantiy is such that it would pay, for the necessary development and putting the mill in order.

The Silver Reef workings lie at the junction of the Silver Nugget and the Nugget claims -- the two having coincident end lines. The vein is well defined and may be traced the full length of the Silver Nuggetclaim to the East and also about two hundred feet Westward into the Nugget claim. It is a quartz vein associated with the contact of rhyolite and earlier granite and made up of small quartz stringers. In some places the vein lies wholly in the granite and in others in the rhyolite; but the best ore seems to be found where it is at the contact, or, in the rhyolite. There are small amounts of wulfenite and vanadinite throughout the workings; also some galena, argentite and native silver. However, the valuable minerals in the opper workings are the hronsilvers. These minersls indicate a lead silver vein in the depth and this is born out by the appearance of galena in the bottom of the winze. At points along the outcrop, the vein is as wide as thirty feet. In the bottom of the winze which is one hundred and twenty five feet below the adit level, or, about two hundred feet below the surface, the vein is fully fifteen feet wide. I believe the longitudinal extension of the ore will be at least fifty feet beyond the present faces. I do not believe ore will be found at any greater depth than the bottom of the winze.

My sampling of the outcrop did not indicate the presence of other ore shoots. There is another vein about seven feet wide seen in the adit at the west end of the Nugget claim. It's strike is about perpendicular to that of the Silver Reef vein. It is highly mineralized. Where I sampled it, it contained 2.20 ounces of silver and some copper. This vein, the Horn Silver and Silver Reef veins constitute the only three veins of any importance on the property.

The property is situated in Pinal County, Arizona, twelve miles from the Southern Pacific railroad, at Casa Grande, and is in the low rugged hills at the edge of the desert. The climate, although very hot in the summer, is such that work may be conducted all the year round. The road across the desert from the Mine is almost level and always passable.

From the assay may, it will be seen that for one hundred and twenty-eight feet along the adit level, the ore averaged 17.36 ounces of silver per ton, over an average width of 7.4 feet. For one hundred and twenty-three feet down the winze, the ore averaged 8.38 ounces of silver per ton over an average width of 5.8 feet. In the raise above the adit level for seventy-two feet, the ore averaged 17.88 ounces of silver per ton over an average width of 3.55 feet. From these figures, there are 1,540 tons of probable ore above the adit level, averaging 15.06 ounces of silver per ton. There are also 7,760 tons of probable ore below the adit level averaging 13.50 ounces of silver per ton.

Assuming a fifteen foot vein and extension of the ore body to fifty feet beyond the present faces, there are 7000 tons above the adit level and 34000 tons below the adit level. The development work necessary to prove or disprove the probable ore and also to develope the ore to the extent of 34000 tons below the adit level and 7000 tons above, could be done by four hundred feet of drifting and one hundred and twenty-five feet of raising. This development work could be done for fifteen thousand dollars. No timbering would be necessary.

There is no appreciable amount of ore above the adit level that will average twenty-five or more ounces of silver to the ton.

The equipment of the old cyanide mill on the Horn Silver property is as follows:

1 - 12" x 14" jaw crusher
1 - Stampmill consisting of 4 batteries and 5 stamps each
1 - 5' x 12' tube mill
1 - 40 H.P. Fairbanks-Morse gas engine
3 - 5' x 16' steel leaching tanks
2 - 8' x 12' steel tanks
5 - 8' x 8' steel tanks
16 - zinc boxes

All this equipment is in a good state of repair and could be made use of in reconstructing the mill. There are several other pieces of equipment such as vanners, boilers and an old type blast furnace. These are all practically worthless. The mill could be made modern and put in order to handle one hundred tons for forty thousand dollars. There is also a Cornish pump and a six horse power gasoline engine on the Horn Silver used to pump water from the Mine. These are in good condition. At the Silver Reef, there is a six horsepower gasoline hoist and forge in good condition.

There is plenty of water in the Horn Silver shaft to run a mill of one hundred ton capacity. A cyanide mill or combined cyanide and flotation mill will be best suited to treat the ore. The cost of mining and milling should not exceed seven dollars per ton. Transportation to Casa Grande costs thirty-five cents per ton mile or four dollars and twenty cents per ton. This price could probably be reduced to three dollars on a contract for a large amount of haulage.

The accessible workings of the Horn Silver showed no material that could be handled profitably. The water level was three hundred and twenty-seven feet below the collar of the shaft measured along the dip. This made some of the lower workings inaccessible. All the available ore has been taken and was mined from the narrow stopes shown on the map to the left of the shaft. There is much more wulfenite and vanadinite shown in these workings than in the Silver Reef.

Very truly yours,

(signed) WAYNE A. HARROD
Wayne A. Harrod

copied

c-o-p-y

701 Hollingsworth Bldg.,
Los Angeles, California.

August 14th, 1917.

Mr. John Hays Hammond,
120 Broadway,
New York City.

Dear Sir:-

I beg to submit for your consideration and approval a plan to finance the treasury of the proposed Silver Reef Mining Company.

This company is in process of formation. The holdings consist of eleven mining claims upon which survey for U.S.patents have been made and it is expected that the patents will be granted some time this fall.

The company being formed will have a capital of 1,000,000 shares par value $1.00 per share.

It is proposed to issue 500,000 of the shares of this corporation to the present owners of this property, as follows:

John Hays Hammond - 40%	200,000	shares
Chas. M. Leonard - 20%	100,000	"
Frank M. Leonard - 20%	100,000	"
Frank W. Royer - 20%	100,000	"
Total shares issued	500,000	"

This will leave 500,000 shares unissued, which can be issued and sold as funds are required for developing and equipping this property.

ASSETS:

The assets of this company will consist of 11 patented mining claims upon which are located a number of living houses, boarding houses, stables, a twenty-stamp mill containing a 15" x 24" Blake crusher, 5" x 12" tube mill, a number of steel tanks, a 40 H.P. gas engine, etc.

The mill building and much of this machinery is in a fair state of repair and will be used when a new milling plant is built.

Located near the upper end of this mill a shaft 250 feet in depth has developed enough water to supply a camp and mill of at least 100 tons daily capacity.

This shaft is equipped with a Cornish type pump, operated by a gas engine, all of which is in good working order.

VEINS AND ORE BODIES:

The country rock is granite and rhyolite. The veins are lead, copper, silver bearing veins at the contract of the granite with the rhyolite, and in some instances entirely in the granite.

The gangue rock of the veins is quartz and brecciated country rock.

Four large veins are within the boundaries of these claims. At one time the veins included within the limits of these claims were owned by a number of different companies or individuals, and considerable work was done and ore shipped from every vein.

The workings having the best showing of ore at present are located in the Nugget claims. A map of these workings accompanies this report.

ORE BODIES IN THE NUGGET WORKINGS:

The workings shown on the accompanying map consist of a short cross-cut tunnel which cuts the vein at a depth of 60 feet below the outcrop; a drift along the vein for a distance of 150 feet, and a winze 40 feet deep below this adit level.

These workings have been thoroughly sampled by me.

The adit level for a length of 120 feet and for a width of ore exposed of 15 feet gives an average of 14.2 ozs. silver per ton. This average does not include high grade ore which has been gouged out and shipped.

Above the adit level there is exposed in the accessible portion of the vein, ore which, over an average width of 4.7 feet assays 36.7 ounces silver.

The vein on the surface and the adit level is from 24 to 35 feet wide,

ORE BODIES:

Before a tonnage of ore can be estimated some development work must be done.

It is estimated that there remains in the old workings above the adit level to the surface and to a distance of 50 feet

beyond the present breasts, 7000 tons of ore having an average value of 25.0 ounces of silver per ton. This is obtained by assuming the vein to be but 15 feet in width while the outcrop and two crosscuts on the adit level show the width of ore to be 33 feet.

Below the adit level, to a depth of 100 feet and assuming the ore to continue to a distance of 50 feet beyond the extremity of the ore opened on the adit level, or a total length of ore shute 250 feet, and assuming the width of workable ore to be but 15 feet, there will be in this block 26,000 tons, value 14.2 oz. silver.

On the dump at the mouth of this adit is 200 tons of ore assaying 15.9 oz. silver.

SUMMARY

	Tons	Ounces Silver	Total Ounces
Above adit level	7,000	25	175,000
To depth 100 feet below	26,000	14.2	369,200
In dump	200	15.9	3,180
	33,200		547,380 oz.

Average per ton 16.5 oz. Silver.

The cost of doing the work necessary to open up this ground sufficient to put the above tonnage figures in sight will be

	feet
Drifts and raises on and above adit level	290
Winze to depth of 100 feet	60
Drifts on 100 foot level	250
Raise	100
TOTAL	600

Practically no timbers or equipment would have to be purchased for this work.

The total cost of doing this work including general expenses, etc. will not exceed $25,000.

Tests have been made upon samples of this ore by several metallurgical firms and they report that by combined flotation and cyanide, a recovery of 90 to 93% of the silver value, with a loss of cyanide of from 1 to 3 lbs. per ton of ore treated.

Assuming a recovery of 80% of the silver and giving no consideration to the lead or small amount of gold in the ore which would be saved by flotation and cyanide, we have:

Total tonnage - - 33,200.

Basis 100 tons daily-Average value per ton 16.5 oz. Silver Silver at 85 cts.

80% of 16.5 oz. - 13.20 oz. at 85 cts. ---------$11.22

Costs.

Mining	$2.00	
To Mill	.25	
Milling	3.00	
Metal realization	.25	5.50
Estimated profit per ton .....l.....$		5.72

To put the present mill in shape to mill economically 75 to 100 tons per day using a combined flotation and cyanide treatment should not exceed a total of $40,000.

SUMMARY AND CONCLUSION

The development of the Nugget mine should bestarted at once. The bottom of the winze and both breasts of the adit level, where work will be started, are in low grade ore, and judging from the meager data obtained from sampling the outcrop, ore may be expected to extend for much longer distances than I have estimated. The money necessary to do the work required is $25,000. which should be raised immediately. Considerable high grade silver ore has been encountered and shipped while running the adit level and it is probable that in doing the work contemplated some revenue can be obtained from shipments.

The chances for opening up a big low grade silver mine are extremely good and the figures given above are simply meant to illustrate what I consider to be the poorest possible outcome of this development work provided the values to not leave entirely as we go down.

Sincerely,

(signed) F.W.Royer

SILVER REEF & SILVER NUGGET.

Note by G. M. Colvocoresses, October, 1937.

The result of Harrod's examination and sampling made this property appear unattractive except for very small scale operations.

Subsequently it was worked by lessees who shipped a considerable tonnage of ore but barely covered their expenses.

In about 1933 some additional development was done and a certain amount of ore was opened up in the lower workings, but according to the most reliable information that I have been able to obtain it is too low grade to be worked with any profit.

Silver Reef

March 4th, 1937

Mr. I. M. Clausen
1724 West Adams St.
Phoenix, Arizona

Dear Mr. Clausen:

Confirming our verbal arrangement of today I am turning over to you the assay map of the Silver Reef Mine which you are to return to me after having had same traced or photostated as you may desire.

I will arrange to have exact copies made or to furnish you with exact copies of the following documents:

Letter and report on Silver Reef Property from Wayne A. Harrod, dated December 4th, 1920.

Report on said property dated May 5th, 1920.

Report on property by L. F. S. Holland, made in 1918.

Report to John Hayes Hammond by F. W. Royer, dated August 14th, 1917,

I will also give you any other data on this property which I may have in my files. The charge for the above information will be the sum of Twenty-five Dollars ($25.00) payable when the documents are received by you. These should be ready for delivery sometime before Thursday of next week.

Yours very truly,

G. M. Colvocoresses.

GMC: DF

ACCEPTED.

I. M. Clausen.

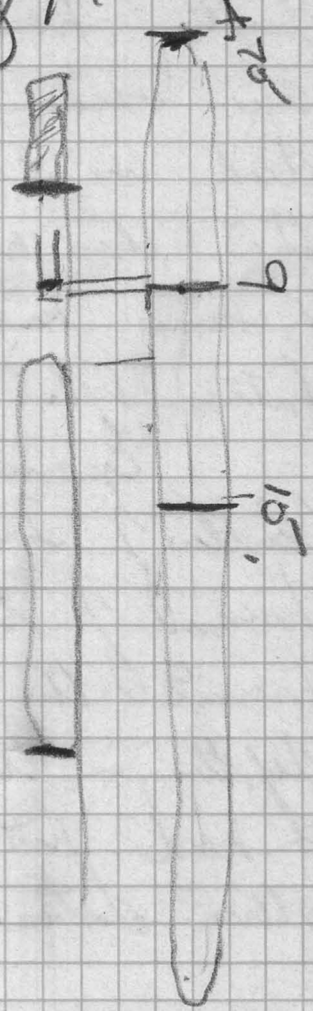
Silver Reefs 8/3/'36

(Owned of F.C. Smith)

Probable 20,000 t of 14 oz

J. M. Clausen

1724 W. Adams St



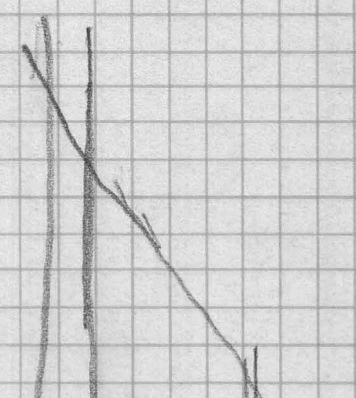
Offered to examine & sample for $300.00 + exp., while he to expend $400.

He will go out of town & be back before end of August when he may write to employ me

---

Fairbank leased & made many shipments

Later (about 27) Frank Leonard Jr & Lem Reade operated a stripped [illegible] of the easily accessible ore.



Then Percy William took it over & persuaded two brokers, a [illegible] two very sick man, to put up a considerable amount of money with which a long adit

Crosscut

was run in at a lower level & some 150' of drifting was done in the vein where the values are said to have held up well. Williams brother died in 31 & the price of silver went to pieces so that this work was not continued but the results of same may have an important bearing on the future value of the mine.

Examination of the property was made by Dean Butler of Tucson who turned it down because of the presence of black calcite which he thought would prevent the deposition of any silver minerals with depth, — this, I feel, was a very broad conclusion & need not be accepted unless supported by other data.

Copied Copy to

NOTES ON SILVER NUGGET and Silver Reef Mine

Location. 12 miles south of Casa Grande, Arizona; by very good road; approximately 19 miles south of the Lake Shore Mine

Date Visited. April 28th, 1920 - with F. W. Leonard and F. B. Church

The property consists of 10 claims and one fraction; owned by the Silver Reef Mining & Milling Co.; see blue print of claims and assay maps attached.

Outcrop and workings lie on the slope of steep hill facing to the north and on tilted contact between granite foot wall and rhyolite hanging wall. I am not certain whether there is a true contact fissure at this point or not; strike of veins East and West.

Silver Ledge workings about 425 feet deep and considerable drifting; also some stoping. Equipped with an old Mill and Lead Jacket for smelting ore. Treatment was concentration and cyanidation of tailings. An attempt was made to smelt the concentrates but appears to have been unsuccessful. The first work done here was in the 70_s and 80_s; mill and smelter constructed in the 90_s. Was apparently largely a stock selling project. Ore carries lead and low values in silver. Workings were not visited and were stated by Leonard to show very little ore.

The Silver Nugget Mine lies 3500 feet east of the Silver Ledge. It is developed by an adit with old stopes and raises to the surface, about 60 feet above a winze about 60 feet deep. Equipment consists of a gasoline engine; small compressor and some rails and mine cars.

Vein is developed for length of about 120 feet in an adit level and apparently no working was done at the bottom of the winze, altho it is said that good ore was found continuously in the winze. Assay maps show ore to continue both ends of drift and apparently ore body is somewhat wider than development would indicate. The width appears to be about 50 feet and the average grade of ore according to Royer's sampling which was checked by Johns is 14 oz. silver. There is no gold and very little lead in this ore. The values are mainly in the form of silver-chloride, also some argentite. The ground is quartz; crushed wall rock and considerable lime. The high-grade ore has been stoped out in stringers and small lenses.

Royer estimated as positive 30,000 tons of 14 oz. ore above the adit. This estimate appears reasonable from measurements and assay map. The principal value of the property lies in the probability of developing a much larger tonnage below the adit and at the other end of the drift. If the vein is actually 50 feet wide it will run into tonnage fast, and the prospect seems well worth additional development which could be accomplished at comparatively small expense. =

I would estimate working costs roughly as follows:

MINING	$2.00	
Treatment	4.00	
Overhead and selling expense	1.00	
Total		$7.00 per ton.

Assume recovery of 80 % of the values and average grade of ore 14 oz. per ton with silver at $1.00 per ounce and a recovery of $11.20 per ton should be effected, leaving a net profit of $4.20 per ton of ore mined or $420,000.00 on the 100,000 tons which should be developed before the Syndicate was obliged to purchase the principal quantity of stock. In this way the Syndicate would be assured of getting their money back even if no more ore were developed and would have a most excellent chance to make a large profit in the probable event of additional ore reserves being proven and subsequently mined and treated.

It would appear from the above that the Mine might be worked profitably with silver down to 70 cents per ounce and the cost figures are believed to be liberal estimates which might be materially improved with practice.

____________________ ~~G. W. C.~~

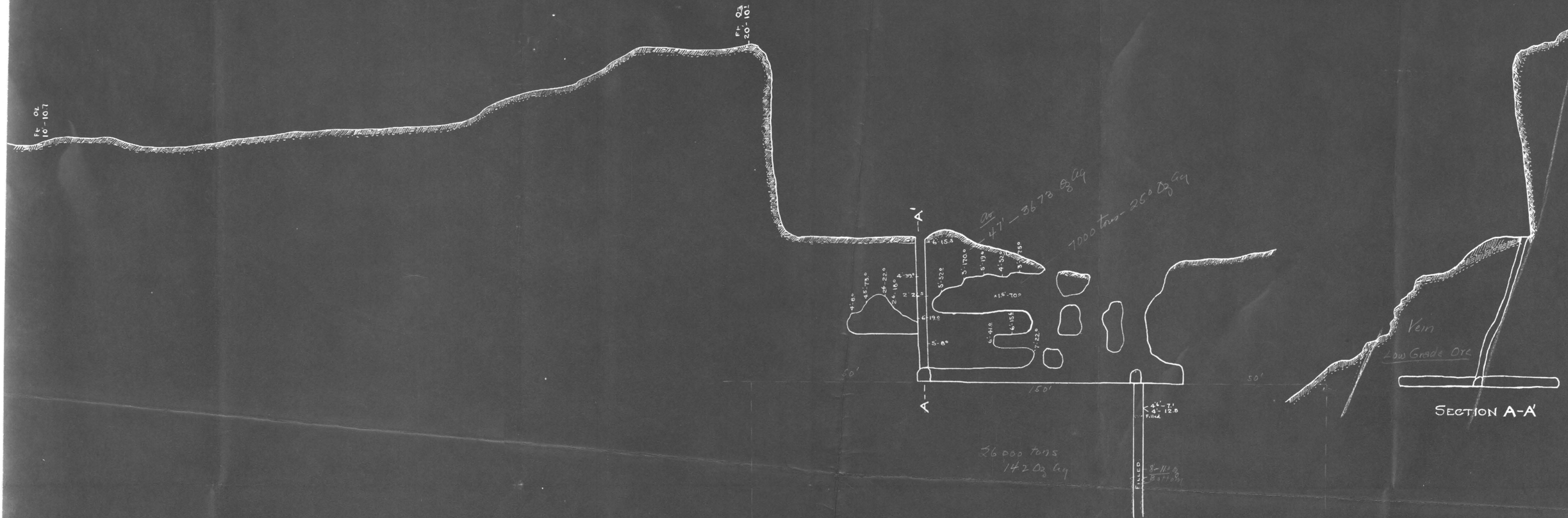
Humboldt, Arizona.
May 5th, 1920. =

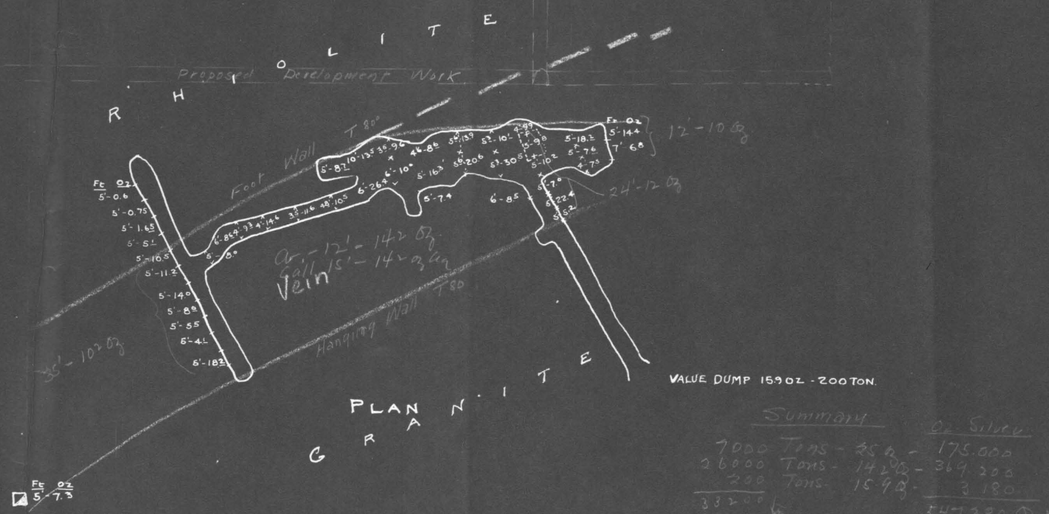
Leonard a Church

~~Note~~

~~Statement not signed but prepared by some member of the Engineering Staff of Western Metallurgical Co.~~

~~G. W. C.~~





ASSAY MAP of SILVER NUGGET MINE

PINAL CO. ARIZONA

Scale 1" = 20'

Assays in ounces of Silver

Summary

		Oz Silver
7000	Tons - 25 Oz -	175.000
26000	Tons - 14 2/10 -	369.200
200	Tons - 15.90 -	3.180
33200		547.380 Oz Silver

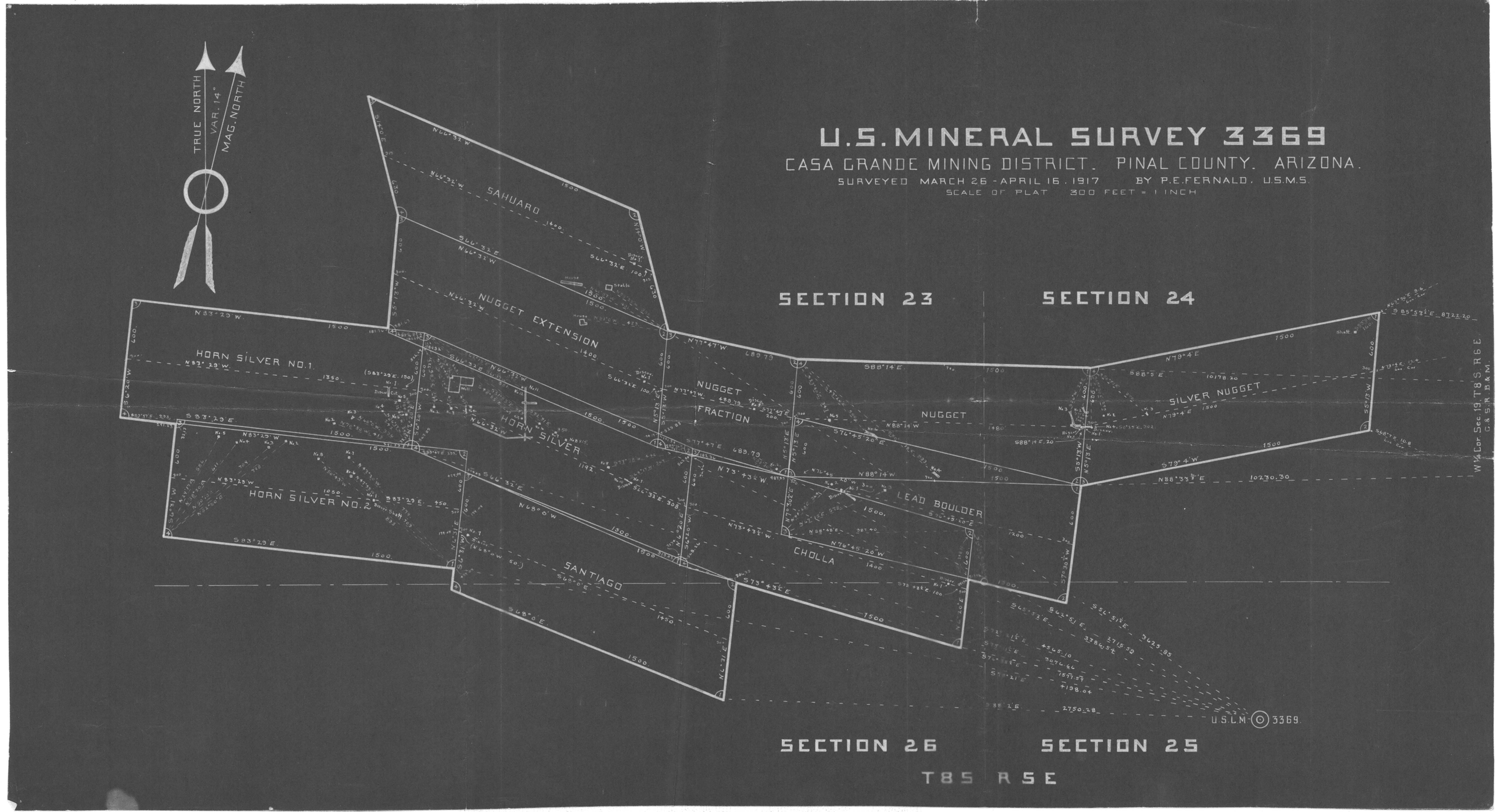
Ave per ton 16.5 Oz

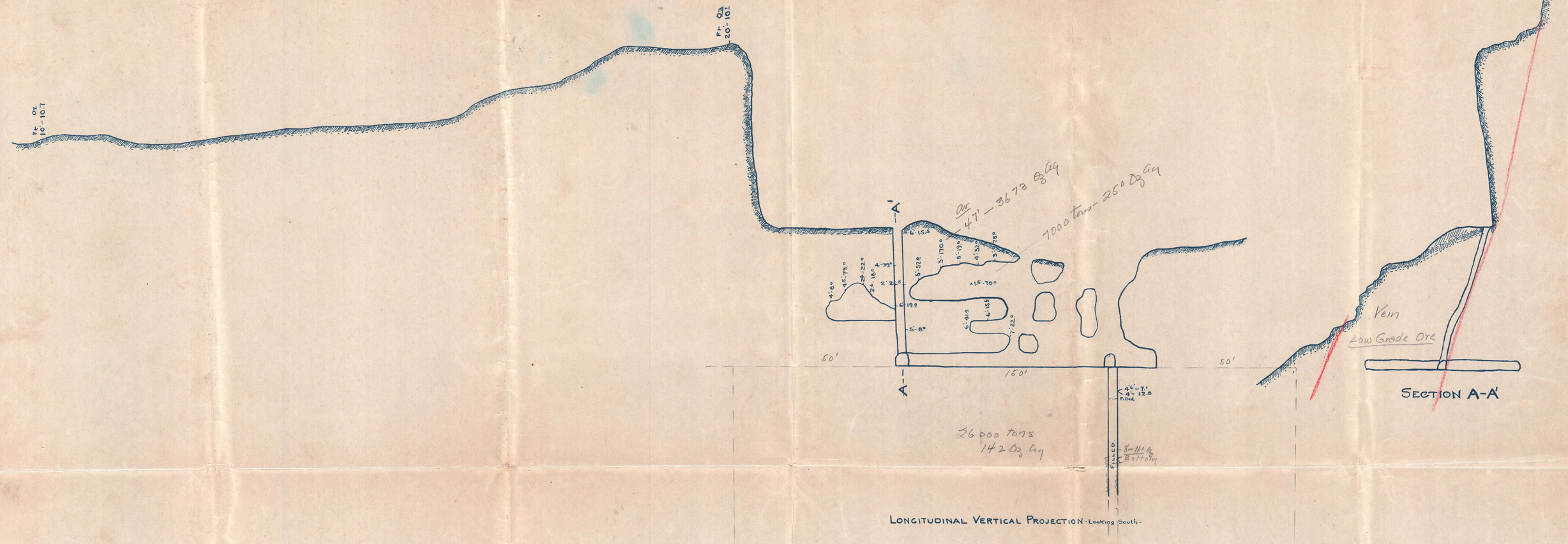
U.S. MINERAL SURVEY 3369

CASA GRANDE MINING DISTRICT. PINAL COUNTY. ARIZONA.

SURVEYED MARCH 26 - APRIL 16, 1917 BY P.E. FERNALD, U.S.M.S.

SCALE OF PLAT 300 FEET = 1 INCH





ASSAY MAP
of
SILVER NUGGET MINE
PINAL CO. ARIZONA
Scale 1" = 20'
Assays in ounces of Silver

Summary		Oz. Silver
7000 Tons	- 25 Oz	- 175.000
26000 Tons	- 14.2 Oz	- 369.200
200 Tons	- 15.9 Oz	- 3.180
33200		547.380 Oz Silver

Ave per ton 16.5 Oz

Silver Reef
File

Silver Reef. assay map